

The Corporation of the City of Kawartha Lakes

Council Report

Report Number ENG2020-018

Meeting Date: October 20, 2020

Title: Lindsay-Ops Landfill Electricity Generation System
Optimization Study

Description:

Ward Number: All Wards

Author and Title: Lisa Peimann, Executive Assistant, Engineering and
Corporate Assets

Recommendation(s):

That Report ENG2020-018, **Lindsay-Ops Landfill Electricity Generation System Optimization Study**, be received;

That staff proceed with continued operation of the generator and implement recommendations in the study to optimize the operation where feasible.

**Department
Head:**

Financial/Legal/HR/Other: _____

**Chief Administrative
Officer:**

Background:

The City of Kawartha Lakes owns the Power Generation, Landfill Gas Collection and Flaring System at the Lindsay-Ops Landfill. The Power Generation facility operates under Renewable Energy Approval Number 8446-9HSGRP. The system is currently operated, maintained and monitored by an external company.

Through the 2019 capital budget process a project was recommended to seek professional services to carry out a study to assess the existing operations and performance of the landfill gas utilization facility, including the recently expanded gas collection system, and provide recommendations for process, operational or other changes to maximize the overall benefit to the City.

A Request for Proposal (RFP) 2019-42-CP Lindsay-Ops Landfill Electricity Generation System Optimization Study was released and advertised in accordance with the Purchasing Policy.

The RFP closed on Thursday June 20, 2019 and staff recommended that The Greer Galloway Group Inc. be selected for the award.

A final report has been submitted by The Greer Galloway Group Inc. with optimization recommendations as requested.

Rationale:

The project scope and methodology was subdivided into the following tasks:

- Review existing hydro contracts
- Review existing operations and manuals
- Downtime reduction review
- Review hydro use
- System operating value
- Financial assessment review
- Similarity assessment
- Landfill gas characteristics
- Optimization goals
- Summary report

Attached as Appendix A is the summary report completed by Greer Galloway.

The analysis covered multiple possibilities for optimizing the operation and value of the landfill gas generation facility. Aspects reviewed included the Hydro One contract, the service call strategy, downtime events, energy use and efficiency, and the landfill gas collection wellfield. Some of the recommendations to optimize operations include:

- Conversion of the billing and generation contracts with Hydro One to Distributed Generation classification could potentially produce cost savings. These changes would need to be negotiated between the City and Hydro One.
- Training landfill staff to perform restarts on weekends, to reduce downtimes. There are times the generator stops running, the current policy prohibits service calls outside of regular operating hours to limit costs. In some cases, the generator requires a straightforward restart that could be accomplished by appropriately trained staff with limited teleconference support from the contractor. This has an immediate effect of returning the generator to activity and increasing the amount of generated electricity.
- Implementing recommendations that were made by Wintek Engineering to reduce the amount of times the generator is shut down.
- Expansion of the wellfield (gas collection) system. Greer Galloway's updated modelling of methane generation potential suggests that the current methane generation rates on the old landfill area may be higher than originally modelled and that the methane collection efficiency in the old landfill area is lower than previously assumed. The construction of additional vertical collector wells within the old landfill area is predicated to improve the overall quantity and quality of the landfill gas delivered to the generator. The approximate cost for this would be \$30,000.

Staff have already started working on these recommendations, the following have been completed/are underway:

- The landfill crew leader has been trained by Comcor on how to restart the generator in order to reduce downtimes.
- Staff are awaiting a review from Hydro One to look into the possibility of migrating to a distributed generation classification to reduce costs. Staff are in conversations with Comcor to prioritize and implement recommendations by Wintek.

Overall, Greer Galloway "believe that the recommended measures will offer a substantial improvement to the financial performance of the system and justifies continued operation of the Lindsay-Ops Gas Generator".

Other Alternatives Considered:

An alternative is status quo without implementing the recommendations however potential revenue from operational improvements would not be realized.

The other alternative would be to decommission the generator. This would not be recommended because the generator provides value to the City in a number of ways as follows:

- Offsetting Hydro electrical expenses to the Wastewater Treatment Facility and Landfill otherwise paid through delivery of electricity from the grid.
- The generator minimizes greenhouses gas emissions to the atmosphere and promotes renewable energy within the City which supports the Healthy Environment Plan.
- It would be premature to consider decommissioning the generator at this point in time as the landfill has yet to reach maximum gas generation and therefore revenue.
- The generator provides redundancy for managing landfill gas. For instance, if the flare is not operating the generator provides added assurance that landfill gases will be managed as per legislation.

Therefore, having considered the alternatives it is our recommendation to continue use of the generator with consideration of the methods to optimize its operation as per the study.

Financial/Operation Impacts:

The economic analysis of the facility examined the assumptions made during the original business case. At the time, the generation potential of the landfill gas was estimated using the best available models. Using actual production numbers has allowed a more accurate evaluation of the generation potential and of Net Present Value.

The study indicates that the operation of the generator can be optimized with changes to the operating practices, contract agreements and wellfield. When taken in aggregate, the identified changes are predicted to increase Net Present Value from negative \$722,388 to over \$1,200,000 – a net increase of about \$2 million. The simulations demonstrate the value of city staff training and strategic well-field expansion and suggest that these improvements will have a synergistic effect when taken together.

Relationship of Recommendation(s) To The 2020-2023 Strategic Plan:

The recommendations set out in this report would conserve City resources for actions that would support any of the four priorities in the Strategic Plan, being:

- A Vibrant and Growing Economy
- An Exceptional Quality of Life
- A Healthy Environment
- Good Government

Review of Accessibility Implications of Any Development or Policy:

N/A

Servicing Implications:

N/A

Consultations:

Manager, Environmental Services
Supervisor, Water and Wastewater Operations
Waste Technician 2

Attachments:

Appendix A – Greer Galloway – Lindsay Ops Landfill Electricity Generation System Optimization Study



Kawartha Lakes
Biogas Report - Final

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Department File: